



## DEPARTMENT OF HEALTH AND HUMAN SERVICES

### National Institutes of Health

#### Government-Owned Inventions; Availability for Licensing

**AGENCY:** National Institutes of Health, HHS.

**ACTION:** Notice.

**SUMMARY:** The invention listed below is owned by an agency of the U.S. Government and is available for licensing to achieve expeditious commercialization of results of federally funded research and development. Foreign patent applications are filed on selected inventions to extend market coverage for companies and may also be available for licensing.

**FOR FURTHER INFORMATION CONTACT:** Yogikala Prabhu, Ph.D., 301-761-7789; [prabhuyo@niaid.nih.gov](mailto:prabhuyo@niaid.nih.gov). Licensing information may be obtained by communicating with the Technology Transfer and Intellectual Property Office, National Institute of Allergy and Infectious Diseases, 5601 Fishers Lane, Rockville, MD 20852; tel. 301-496-2644. A signed Confidential Disclosure Agreement will be required to receive copies of unpublished information related to the invention.

**SUPPLEMENTARY INFORMATION:** Technology description follows:

**Methods for Using Modulators of Extracellular Adenosine or an Adenosine Receptor to Enhance Immune Response and Inflammation.**

**Description of Technology:**

Local inflammation processes are crucially important in the host defense against pathogens and for successful immunization because proinflammatory cytokines are necessary for initiation and propagation of an immune response. However, normal inflammatory responses are eventually terminated by physiological termination mechanisms, thereby limiting the strength and duration of immune responses, especially to weak antigens. The inventors have shown that adenosine A2a and A3a receptors play a critical role in down-regulation of inflammation in vivo. They act as the physiological termination mechanism that can limit the immune response. Thus, a method was developed for inhibiting signaling through the adenosine receptor to prolong and intensify the immune response. The method involves administering either an adenosine-degrading drug or an adenosine receptor agonist. These compounds can be also used as vaccine adjuvants and treatments for accomplishing targeted tissue damage such as for tumor destruction.

This technology is available for licensing for commercial development in accordance with 35 U.S.C. § 209 and 37 CFR Part 404, as well as for further development and evaluation under a research collaboration.

**Potential Commercial Applications:**

- Anti-tumor therapy
- Vaccine adjuvants for tumors
- Immunotherapy

**Competitive Advantages:**

- Use of adenosine receptor agonist or adenosine-degrading drug to inhibit signaling through the adenosine receptor to prolong and intensify the immune response.
- Use of adenosine receptor agonists or adenosine-degrading drugs as vaccine adjuvants for tumor destruction.

**Development Stage:**

- Pre-clinical

**Inventors:** Michail V. Sitkovsky, M.D. (previously at NIAID), Akio Ohta (previously at NIAID)

**Publications:** Ohta A. et al., "Role of G-protein-coupled adenosine receptors in downregulation of inflammation and protection from tissue damage," Nature 2001 Dec 20-27; 414 (6866):916-20.

**Intellectual Property:** HHS Reference No. E-051-2002-0

- U.S. Divisional Application No. 16/391,423- filed April 23, 2019, entitled “Methods for Using Modulators of Extracellular Adenosine or an Adenosine Receptor to Enhance Immune Response and Inflammation” [HHS Reference No. E-051-2002/0-US-19]

All issued and active U.S. patents (claiming priority to U.S. Provisional Application Nos 60/340,772 filed December 12, 2011, and 60/342,585 filed December 19, 2001) related to the above-referenced technology:

- US Patent 8,080,554, issued December 20, 2011 (application 10/498,416 filed on 06/10/2004)
- US Patent 8,716,301, issued May 06, 2014 (application 13/310,264 filed on 12/02/2001)
- US Patent 9,415,105, issued August 16, 2016 (application 14/067,005 filed on 10/30/2013)
- U.S. Patent 10,314,908, issued June 11, 2019 (application 15/237,316 filed on 08/15/2016)

**Licensing Contact:** To license this technology, please contact Yogikala Prabhu, Ph.D., 301-761-7789; prabhuyo@niaid.nih.gov, and reference E-051-2002-0.

**Collaborative Research Opportunity:** The National Institute of Allergy and Infectious Diseases is seeking statements of capability or interest from parties interested in collaborative research to further develop, evaluate or commercialize this technology. For collaboration opportunities, please contact Yogikala Prabhu, Ph.D., 301-761-7789; prabhuyo@niaid.nih.gov.

Dated: June 10, 2022.

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